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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/02/1993 08/02/93 08/02/93

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EXAMINER

08/02/1993

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ART UNIT	PAPER NUMBER
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2931
DATE MAILED:

12/22/93

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

9/245499

Applicant(s)

Khandros et al.

Examiner

Curew

Group Art Unit

2331

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 2/5/99, 4/5/99 & 6/5/99
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 39-42 is/are pending in the application.
- ☐ Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 39-42 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☒ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☒ The drawing(s) filed on 2/5/99 is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 10
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

Part of Paper No. _____

DETAILED ACTION

Drawings

1. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

2. The drawings are objected to by the examiner for improper cross hatching. All the parts shown in section should be cross hatched according to MPEP 608.02, page 600-84.

The drawings are also objected to because those figures showing that which is old are **not** labeled with a prior art legend. Such a label is required.

Also, the embodiment of the invention claimed is not shown in the drawings and explained in the detailed description of the invention. An illustration and explanation are required.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Treatment of Claims Based on Language and Format

35 U.S.C. § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 39-112 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 39, line 3, "each interconnection element" should be "each of said interconnection elements." Please correct this in all of the claims.

Use of Markush language to describe an open set, such as that in claim 41, is improper. A suggested correction is to state "the group of . . ."

The use of "precursor element" is indefinite, because this term does not have sufficient antecedent basis. First occurrence is in claim 40.

The term cross-dimension is confusing. Please replace this term with diameter.

"The respective terminal," for example in claim 45, lacks proper antecedent basis. Examiner suggests "a respective one of the terminals."

The limitations that the second material dominates the resiliency and that the second material is stronger have not been considered from the stand point of art, because these limitations are vague. See for example claims 46-47. It is unclear what structural bearing these limitations have on the invention. Therefore, it is not possible for the examiner to evaluate the prior art to determine whether these properties exist or not. Also, such description of the properties (to dominate or stronger) are indefinite, because they are imprecise.

The description that the second material dominates the resiliency, for example in claim 46, is indefinite, because the structural manifestation of this limitation is unknown. This also pertains to the limitation of the second material being stronger, as in claim 47.

In claim 60, line 3, "partially returns" is indefinite, because its metes and bounds are unknown.

The description of the shape of the elements in claims 59-60 is very confusing. Please rewrite these claims to describe the shape through its geometry and without reference to movement. For example, claim 59 can recite that the interconnection element has at least one bend.

The use of distant, for example in claim 61, is confusing, because this word has relativistic implications (to be far). Examiner suggests the description "spaced apart" instead.

The use of "substantially" in conjunction with being in a common plane is indefinite, for example see claim 62. The regions are in a common plane or not.

Claim 62 does not make sense to the examiner. It appears that the claim intends to state that all of the contact regions of the elements are coplanar.

The term readily shaped, for example in claim 65, is confusing. It is unclear what a readily-shaped material is.

The number 0.00010 does not make sense, because the other limit of the range is specified to a lesser accuracy (one significant figure). First occurrence in claim 52. Examiner recommends changing this to 0.0001.

Please correct these and similar errors in all of the claims whether or not specific mention of the claim is made above.

Treatment of Claims Based on Prior Art

35 U.S.C. § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 39-55, 57-82, 84-112 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanji et al. (US 5067007, hereafter Kanji).

Kanji discloses a substrate or semiconductor die (6, claims 39, 64, 86-87, 96-97, 105-106) having terminals (8) and flexible, resilient (claim 65, 86, 96, 105) interconnection elements (11). See figures 1A, 1C and 1D. The elements have elongated elements of a first material (11A) attached to the terminals and a second material (11B) coating (claims 48, 58, 75, 85-86) the elongated elements (claims 40, 63). The first material comprises Cu (claims 41-42, 57, 68-69, 84, 88, 95, 98, 104, 107), column 7 at line 63, and the second material can be Ni or Au (claims 49-50, 76-77, 92, 95, 101, 104, 110), column 7 at line 65, directly on the first material (claim 55, 57, 82, 84).

Claims 45, 72, 90, 109: The second material (11B) is also attached to (8).

Claims 54, 81: Both of the first and second material are conductive.

Claims 59-60, 66: The embodiment of figure 7A discloses the elements extending from the die with the additional feature that of at least one bend where the lead changes direction then returns.

Claims 61-62, 67: The distant contact regions are the other ends of the elements near substrate (1). These regions are coplanar.

Claims 43-44, 53, 70-71, 80, 89, 94, 99, 103, 108, 112: The range .0007 to .003 inches is .018 to 0.18 mm. Kanji teaches this diameter at column 2, line 22.

Claim 51-53, 78-80, 93-94, 102-103, 111-112: The range .00010 to .003 inches is

2.54 to 76.2 μm . Kanji teaches this range for the nickel coating at column 8, line 1.

Claims 46-47, 73-74, 91, 100: Considering the section 112 rejections above, the structural features of these claims are identical to those of Kanji; therefore, Kanji anticipates these claims.

35 U.S.C. § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 56 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanji.

Kanji discloses the claimed invention as explained with respect to claims 40 and 63, except for a barrier layer. Nevertheless, it would have been obvious to one of ordinary skill in

the art, at the time the invention was made, to interpose a barrier layer between the first and second materials, because use of these layers is routine in the art. Barrier layers are provided between the core of a contact element and the outer coat to prevent diffusion of the core and coat into each other, or to provide a seed layer so that the coat layer can be grown on the core.

Information Disclosure Statement

10. The IDS of 2/17/98, paper #3, appears to be duplicate to the IDS of 10/26/99. Paper #3 has not been considered by the examiner. Please resubmit paper #3 with the duplicate references removed. Paper #10 and the references contained therein have been considered and a signed copy is attached to this office action.

Closing

11. Any inquiries concerning this communication or earlier communications from the examiner should be directed to Examiner Kamand Cuneo at (703) 308-1233. Examiner Cuneo's supervisor is Mrs. Kristine Kincaid whose telephone number is (703) 308-0640.

Kristine Kincaid
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Supervisor, Examining Division
Patent Office
December 19, 1999

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December 19, 1999